

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

- 1 1. (Currently amended) A compiler for producing an object program from a
2 source program ~~used to be executed on an architecture equipped with a plurality of memory~~
3 ~~hierarchies from a source program in conjunction with a computer system, the compiler~~
4 configured to operate a computer to perform steps comprising:
5 a step for ~~detecting interpreting either an option or a~~ designation statement
6 designating which memory hierarchy among the plurality of memory hierarchies will serves as
7 the main data store for an object program ~~a target program mainly refers to data present in, when~~
8 ~~the target object program is executed; [[and]]~~
9 a step for performing an optimizing process directed to said designated memory
10 hierarchy to produce the object program; and
11 a step for storing the object program on a data store.
- 1 2. (Currently amended) A compiler as claimed in claim 1, wherein:
2 ~~as said optimizing process directed to the designated memory hierarchy, a~~
3 memory latency is calculated according to the designated memory hierarchy with respect to an
4 instruction for accessing a memory location in the designated memory hierarchy; and an wherein
5 said optimizing process responding to is based on the calculated latency is carried out.
- 1 3. (Currently amended) A compiler as claimed in claim 1, wherein:
2 ~~as said optimizing process directed to the designated memory hierarchy, a loop~~
3 transformation method of a loop interchange, a loop unrolling, or a loop tiling is determined
4 according to the designated memory hierarchy with respect to a memory access instruction; and
5 wherein said optimizing process is based thereon.

1 4. (Currently amended) An object program producing method executed by
2 both a computer system and a compiler executing on the computer system for producing an
3 object program ~~used~~ to be executed on an architecture equipped with a plurality of memory
4 hierarchies from a source program ~~in conjunction with a computer system~~,
5 said method comprising:
6 a step for detecting ~~interpreting either an option or a~~ designation statement
7 designating which memory hierarchy ~~a target~~ an object program mainly refers to for storing and
8 accessing data ~~present in~~, when the ~~target~~ object program is executed; ~~[[and]]~~
9 a step for performing an optimizing process directed to said designated memory
10 hierarchy to produce the object program; and
11 a step for outputting and storing the object program on a data store.

1 5. (Currently amended) A code producing method as claimed in claim 4,
2 wherein:
3 ~~[[as]]~~ for said optimizing process directed to the designated memory hierarchy, a
4 memory latency is calculated according to the designated memory hierarchy with respect to a
5 memory access instruction; and an optimizing process according to the calculated latency is
6 carried out.

1 6. (Currently amended) A code producing method as claimed in claim 4,
2 wherein:
3 ~~[[as]]~~ for said optimizing process directed to the designated memory hierarchy, a
4 loop transformation method of a loop interchange, a loop unrolling, or a loop tiling is determined
5 according to the designated memory hierarchy with respect to a memory access instruction.

1 7. (Canceled)

1 8. (Original) A storage medium wherein:
2 said storage medium has stored thereinto the compiler recited in claim 1.

1 9. (Currently amended) A method for producing an object program ~~used to~~
2 be executed on an architecture equipped with a plurality of memory hierarchies from a source
3 program in conjunction with a computer system, wherein:

4 said computer system executes:

5 a step for ~~analyzing-detecting~~ a designation statement designating which hierarchy
6 an object program mainly refers to for storing data ~~stored in a memory of,~~ when said object
7 program is executed; [[and]]

8 a step for producing said object program in which an optimizing process including
9 different processes sequences according to said plural memory hierarchies is carried out with
10 respect to said source program, ~~and an object program which has been optimized as to an access~~
11 ~~to said memory hierarchy is produced~~ by selecting a process[[es]] sequence corresponding to the
12 memory hierarchy designated by said designation statement; and

13 a step for storing the object program on a data storage device.

1 10. (Original) An object program producing method as claimed in claim 9,
2 wherein:

3 said designation statement is described in an option within a compiler initiating
4 command.

1 11. (Original) An object program producing method as claimed in claim 9,
2 wherein:

3 said designation statement is inserted into said source program.

1 12. (Original) An object program producing method as claimed in claim 11,

2 wherein:

3 said designation statement is applied to each of plural loops contained in said
4 source program;

5 said analysis step includes a step for forming a loop table indicative of a
6 correspondence relationship between the respective loops and the memory hierarchies designated
7 by the designation statements corresponding to said loops; and

8 said execution step includes a step for acquiring a memory hierarchy designated
9 by said designation statement by referring to said loop table.

1 13. (Original) An object program producing method as claimed in claim 9,

2 wherein:

3 said memory hierarchies include a hierarchy constructed of a primary cache, a
4 hierarchy constructed of a secondary cache, and a hierarchy constructed of a main storage
5 apparatus.

1 14. (Original) An object program producing method as claimed in claim 9,

2 wherein:

3 said optimizing process contains at least one of an optimizing process by
4 instruction scheduling, a prefetch optimizing process, and an optimizing process by loop tiling
5 and loop interchange/loop unrolling.

1 15. (Original) An object program producing method as claimed in claim 14,

2 wherein:

3 said optimizing process corresponds to the optimizing process by the instruction
4 scheduling; and a number of memory access latency cycles to be set are different from each other
5 according to said memory hierarchies in said processes sequence.

1 16. (Original) An object program producing method as claimed in claim 14,
2 wherein:
3 said optimizing process corresponds to the prefetch optimizing process; and
4 timing of a prefetch code to be inserted is different from each other according to said memory
5 hierarchies in said processes sequence.

1 17. (Original) An object program producing method as claimed in claim 14,
2 wherein:
3 said optimizing process corresponds to the optimizing process by the loop tiling; a
4 tile size is different from each other according to said memory hierarchies in said processes
5 sequence.

1 18. (Original) An object program producing method as claimed in claim 14,
2 wherein:
3 said optimizing process corresponds to the optimizing process by the loop
4 interchange/loop unrolling; and in said processes sequence, it is determined to apply, or not to
5 apply either the loop interchange or the loop unrolling according to said memory hierarchies.

1 19. (Currently amended) An apparatus for producing an object program used
2 to be executed on an architecture equipped with a plurality of memory hierarchies from a source
3 program, comprising:

4 a storage apparatus for previously storing therein an optimizing process
5 containing different process[[es]] sequences according to said plurality of memory hierarchies;
6 an input apparatus for inputting said source program and a designation statement
7 designating which memory hierarchy an object program mainly refers to data present in, when
8 said object program is executed;

9 a processing apparatus for producing an optimized object program based upon
10 both said source program and said designation statement; and

11 an output apparatus for outputting said optimized object program; wherein:

12 said processing apparatus executes:
13 a step for analyzing said designation statement;
14 a step for producing an object program which has been optimized as to an
15 access to said memory hierarchy by selecting a processes sequence corresponding to the
16 memory hierarchy designated by said designation statement; and
17 a step for outputting said optimized object program ~~from~~from said output
18 apparatus.